Bourns®
Product Profile

Automotive Sensors
Circuit Protection Solutions
Magnetics Products
Microelectronic Modules
Precision Potentiometers
Panel Controls & Encoders
Resistive Products

Bourns®
Product Profile

Table of Contents

Enter the New World of Bourns.

Trimpot® Trimming Potentiometers

Applications

Brightness/contrast controls

Microcontrollers

Phone headsets

Power supplies

Credit card readers

CATV decoders

Plasma televisions

LCD controllers

Lighting controls

Smoke detectors

Speakers

Process controllers

Temperature sensors

Torque sensors

Base stations

Stereo equipment

Voltage meters

Magnetic card readers

RF meters

Controller daughter boards

Printers

Two-way radios

Security systems

Disk drives

Satellite receivers

A/D converters

Types Available:

- Surface mount
- Through-hole
- Single-turn
- Multiturn
- Sealed
- Open frame

Features:

- Top, bottom, side, front and back adjust
- 2 mm to 12.7 mm sizes
- Tube, bulk, embossed tape, ammo pack, radial tape and reel
- Compatible with pick and place equipment

3318

3362

3296

3224

3313

TC43
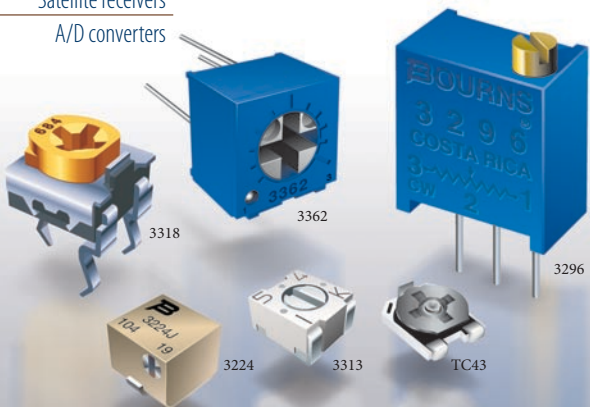
Linear Motion Potentiometers

Applications

Types Available:

- Rectangular body
- Flexible lead
- Conductive plastic element

Features:

- 0.12 to 0.25 watt power ratings
- 3.81 mm to 12.7 mm stroke lengths
- 500,000 cycles actuation life
- 1k ohm to 50k ohm standard resistance values

3048

3046

COMPONENTS

Resistor & RC Networks

Applications

Types Available:

- Thick film resistor networks
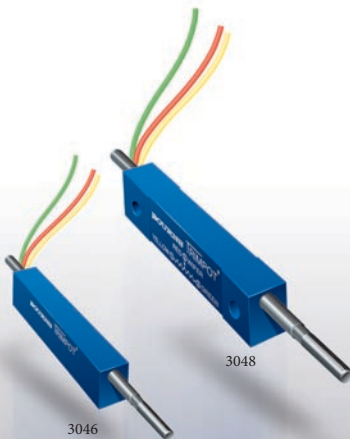- Thin film resistor networks
- Resistor/capacitor (RC) networks
- Capacitor networks
- RoHS compliant units available in all models

Features:

- Surface mount and through-hole mounting
- SIP and DIP packages
- Molded and conformal-coat packages
- Standard resistance values from 10 ohms to 10 megohms
- Custom networks for non-standard circuits and values
- SIP package height as low as 0.195 inch
- Operating temperature range of −55 °C to +125 °C
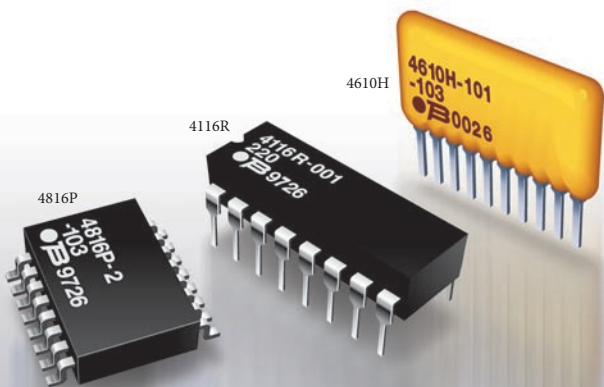
4610H

4116R

4816P

Switches

Applications

Types Available:

- Rotary
- Tactile

Features:

- Surface mount and through-hole mounting
- PC pins, gull wing, and J-hook terminal styles
- Sealed and boardwashable types
- 3, 4, and 6 mm sizes
- Tube and embossed tape carrier packaging

7829

7914

7813

7814

Chip Resistors & Chip Arrays

Applications

Types Available:

- Thick film chip arrays
- Thick film chip resistors
- Thin film chip resistors
- Metal film chip resistors
- RoHS compliant units available in all models

Features:

- Standard resistance values from .001 ohms to 10 megohms
- Standard resistance tolerances .01 %, 1.0 % and 5.0 %
- Chip resistors from 0201-size to 2512-size
- Chip arrays from 0402 x 2-size to 0603 x 8-size
- Operating temperature range of −55 °C to +125 °C

CAT16

CAY103

CRL2512
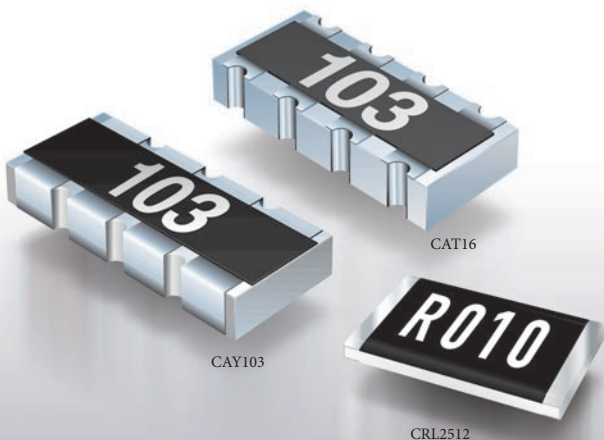
Modular Contacts

Applications

Cellular phones

PDAs

Laptop computers

Rechargeable battery packs

Types Available:

- Male
- Female

Features:

- Precious metal
- 2-6 contacts
- 2.54 mm, 4.0 mm pitch and height
- Through-hole and surface mount
- Normal force – 80 grams minimum
- Contact resistance – < 0.030 ohms
- Tube, embossed tape, 13 " reel packaging

70AD

70AA

70AB
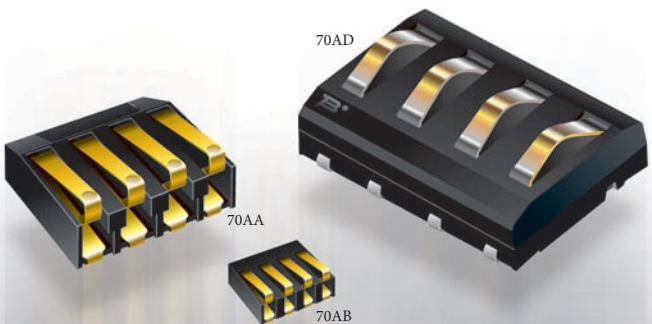
Inductors & Transformers

Applications

Types Available:

Chip Inductors
- Laser-spiraled
- Molded wirewound
- Multilayer ceramic
- Multilayer ferrite
- Open wirewound

Power Inductors
- Non-shielded
- Shielded
- High current toroids
- Dual chokes

Chip Beads
- Low impedance
- High current
- High impedance

Transformers
- Line-matching
- Wideband
- ISDN
- xDSL
- LAN
- PoE/VoIP

Features:

- Standard inductance values from 1.0 nH to 500 mH
- 20 models of chip inductors
- More than 80 models of surface mount power inductors
- More than 50 models of through-hole power inductors
- Available in a wide range of sizes
- Operating temperature as high as 150 °C
- Sealed and open construction
- Surface mount and through-hole models

2100

CM Series   SRR0603   LM-NP   SDR1006

Diodes

Applications

Types Available:

- Switching diodes
- Schottky barrier diodes
- Zener diodes
- Schottky rectifier diodes
- Fast response rectifier diodes
- High voltage rectifier diodes
- Transient voltage suppressor (TVS) diodes
- Transient voltage suppressor (TVS) diode arrays
- Steering diode arrays
- Bridge rectifier diodes

Features:

- RoHS compliant*
- Surface mount devices
- Leadless - DFN2, DFN4, DFN6, DFN10, 0603, 1005, 1206, 1408, 1607, 2010 & 2320 packages available
- SMA, SMB, SMC, SOT563, SC70-6, SOT23 & SOT23-6 packages available
- 8L & 16L NSOIC, 16L WSOIC & 10L MSOP packages available
- Tape & reel packaging

CDDFN6
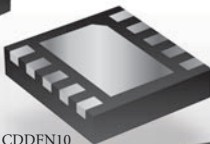
CDDFN10
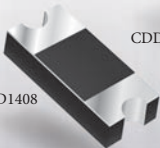
CD1408

CD214
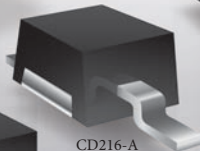
CD216-A

CD1005

*RoHS Directive 2002/95/EC
Jan. 27, 2003 including Annex.

9
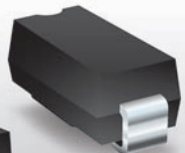
Thin Film on Silicon Networks

Applications

Computers

Automotive

Telecommunications

Industrial controls

Consumer products

Medical products
(excluding critical life support)

Instrumentation

Types Available:

- Thin film on silicon networks:
  1 %, 2 %, 5 % standard, 0.8 %,
  0.5 % precision

Features:

- Isolated resistor, bussed resistor
  & termination networks

- RC & T filtering networks

- Diodes for ESD protection

- Low TCR & TTCR
  precision values

- SMD, NSOIC & QSOP packaging
  with 8 to 28 pins, depending
  on circuit

2DEA

2QSP16J

2NBS16J
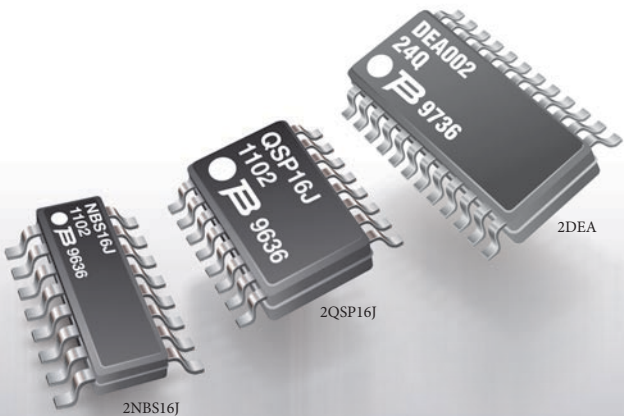
Power Resistors

Applications
Couplers
Isolators
Filters
White goods
Motor controllers
Power supplies
Metering

Types Available:
- TO220 packages
- Flange mounts
- Chips
- Wirewound
- Metal alloys
- Thick film technology

Features:
- Through-hole and surface mount
- 0.002 Ω to 100k Ω
- 0.5 watts to >800 watts
- 0.1 % to 5 % tolerances
- Operating temperature up to 275 °C
- Low TCR
- Frequency range from DC to 9 GHz

PWR220-2S

PWR4525

CHF3725

CHF9838

CHF3523

CHF210
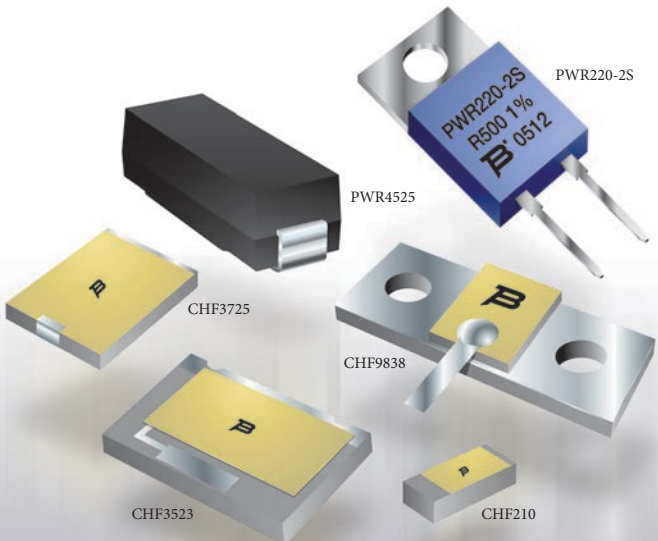
Multifuse® freeXpansion™ Products

Applications

USB 2.0, USB 3.0 & HDMI
port protection

PC motherboards -
plug & play protection

Mobile phones -
battery & port protection

PDAs / digital cameras

Industrial controllers

Portable medical devices
(excluding critical life support)

Portable memory

Game consoles

GPS navigation systems

Types Available:

- MF-FSMF Series
  (0603 / 1608 metric)
- MF-PSMF Series
  (0805 / 2010 metric)
- MF-LSMF Series
  (2920 / 7555 metric)
- MF-MSMF Series
  (1812 / 4532 metric)
- MF-USMF Series
  (1210 / 3225 metric)
- MF-NSMF Series
  (1206 / 3216 metric)
- Easily customizable

Features:

Unique freeXpansion™ design
provides:

- Smallest PTCs
- Highest voltage withstand
- Highest hold current (I_{hold})
- Extended product life
- Greater resistance stability

MF-MSMF Series

MF-USMF Series

MF-NSMF Series

MF-PSMF Series

MF-FSMF Series
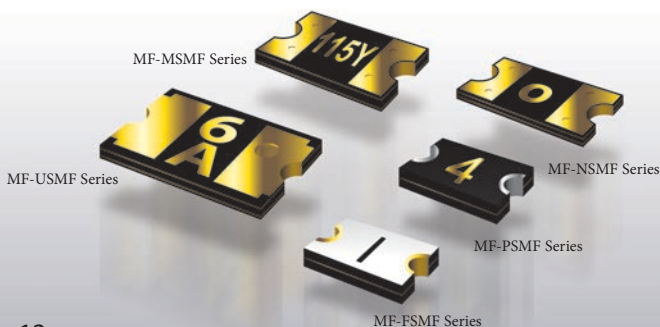
Multifuse® PTC Resettable Fuses

Applications

Computers

Batteries

Automotive

Telecommunications

Industrial controls

Portable electronics

Medical products
(excluding critical life support)

Point of Sale

Game consoles and toys

Security systems

DC motors

Types Available:

- Radial leaded through-hole
- Surface mount (0805, 1206, 1210, 1812, 2018, 2920 & 3425)
- Axial leaded battery strap
- Unencapsulated disk

Features:

- 6 to 90 V operating voltages
- Hold currents from 50 mA to 11.0 A
- Agency approval - UL, CSA & TÜV
- Interrupt voltages of 250 V and 600 V with surge capabilities for assisting in meeting US and international telecom requirements
- High temperature polymers available with operating temperatures between −40 °C to +125 °C
- Custom designs available upon request
- Bulk, embossed tape and ammo pack packaging
- RoHS compliant* standard & halogen free upon request

MF-R/600 Series

MF-R Series

MF-VS Series

VS210N 2018T

185 JB 1A

MF-SM

MF-NSMF Series

DJK

115Y

MF-MSMF Series

4

Customized Resettable Fuses

MF-PSMF Series

*RoHS Directive 2002/95/EC
Jan. 27, 2003 including Annex.

13
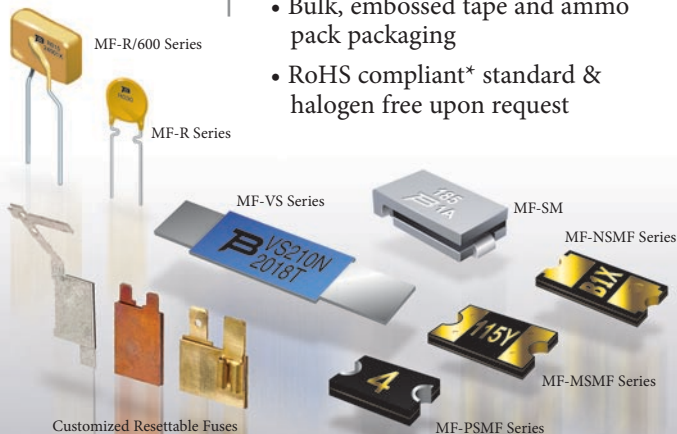
TBU™ Electronic Current Limiters

Applications

POTS linecards

VoIP equipment

ONUs and ONTs

Gateways and modems

10/100 & Gigabit Ethernet

VDSL interfaces

Remote metering & surveillance

Avionics (DO160)

Rail and mass transit

Industrial automation

Test equipment

RS232, RS422, RS485, CANbus and LVDS

Introduction:

TBU products are high-speed electronic current limiters designed to protect against faults caused by short circuits, AC power cross, induction and lightning surges.

The TBU blocks surges, providing a barrier to sensitive electronics and eliminating exposure to large voltages or currents during surge events.

Features:

- Extremely high-speed performance
- Blocks high voltages & currents
- Exceptionally low let-thru energy
- Very high bandwidth, GHz compatible
- UL recognized components

C650

P500

P40

P850-U
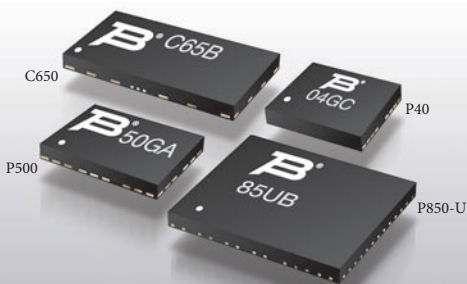
TISP® Thyristor Surge Protectors

Applications

Central office POTS

Access equipment POTS

Fiber to the home

xDSL and integrated linecards

PABX protection

VOIP protection

xDSL modem protection

ISDN linecards and NT equipment

V.92 modems

Cordless DECT and analog phones
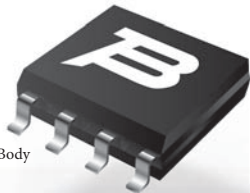
Set top boxes

Types Available:

- Unidirectional
- Bidirectional
- Programmable

Features:

- Protection voltages from 15 V to 700 V
- Dedicated SLIC protection
- Telephone port protection
- VDSL protection
- UL recognized
- Enables Telcordia GR-1089, UL 60950, FCC (TIA), ITU-T, IEC & YD/T compliance
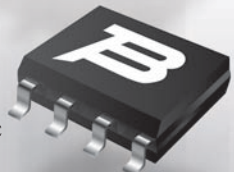- 25 years experience in telephone protection

SMB

SOIC Wide Body

SMAJ

SOIC

Line Protection Modules

Applications

Telecom circuit protection

Types Available:

- Through-hole
- Surface mount
- Multifunction modules

Features:

- Precision tolerance overcurrent protection
- Resistance values from 5.6 ohms to 100 ohms
- Withstands lightning surge and AC power cross
- Assists in meeting Telcordia GR-1089 and ITU-T K.20/K.21/K.45 specifications
- Operates safely under fault conditions
- Nonflammable
- UL 497A recognized
- One shot fuse options
- Resettable fuse options
- Custom designs available

4A12P-1AH-12R5LF

4B06B-504-RC

4B06B-540-125/219

4B06B-514-500LF

Gas Discharge Tubes (GDT)

Applications

Telecommunications

CATV/broadband

Industrial and process control

Transportation signaling

Consumer electronics

Types Available:

- TRIGARD® - 3 electrode balanced GDTs
- Mini-TRIGARD™
- MSP® protectors
- 2 electrode GDTs

Features:

- 75 V to 1100 V operating voltages
- Multiple lead configurations
- Surface mount
- Tape and reel packaging
- Switch-grade fail-short
- High surge-energy handling
- Low capacitance
- UL, Telcordia, REA, IEEE, ITU-T and IEC recognition

2036 / 2038-XX-SM

2027-XX-B

2026-XX-C2F

2035 / 2039-XX-SM

2036

2026-MSP

17
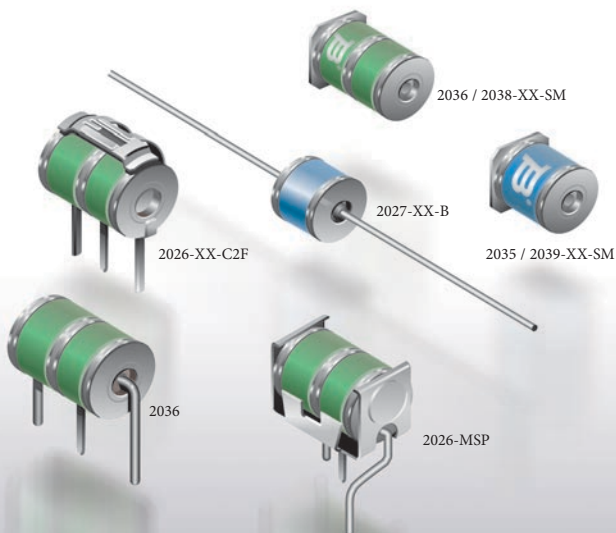
Telefuse™
Telecom Fuses

Applications

Telecom circuit protection

Types Available:
• Surface mount

Features:
• Telecom overcurrent protection
• Withstands lightning surge and AC power cross
• Assists in meeting Telcordia GR-1089 and UL 60950 specifications
• Operates safely under fault conditions
• RoHS compliant*

B2.00T

B1.25T

B0.50T

*RoHS Directive 2002/95/EC
Jan. 27, 2003 including Annex.
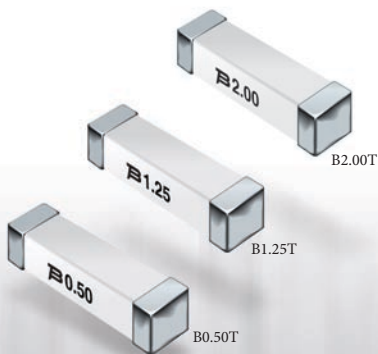
ESD Protection Solutions

Applications

General purpose ESD protection

High speed communication ports such as USB 2.0, IEEE1394, HDMI Gb ethernet

Fast communication ports such as USB 1.1, 10/100b ethernet ports

RS232, RS422 & RS485 type applications

Types Available:

- Transient voltage suppressor (TVS) diodes
- Transient voltage suppressor (TVS) diode arrays
- Steering diode arrays
- ChipGuard® ESD suppressors
- Schottky diode arrays

Features:

- Active & passive elements in a single package
- Excellent high frequency response
- ESD protection to industry specification IEC 61000-4-2
- Minimum 8 kV contact and 15 kV air discharge ESD withstand
- SMT Packages (0402, DFN2, 0603, 0805, 1206, DFN4, DFN6, DFN10, SOD323, SOT563, SC70-6, SOT23, SOT23-6, SOT143A, NSOIC 8L, NSOIC 16L & MSOP 10L)

CDNBS

2DEA

CDDFN4

CG0805

CDDFN6

CG0402

CDDFN10

CG0603

19
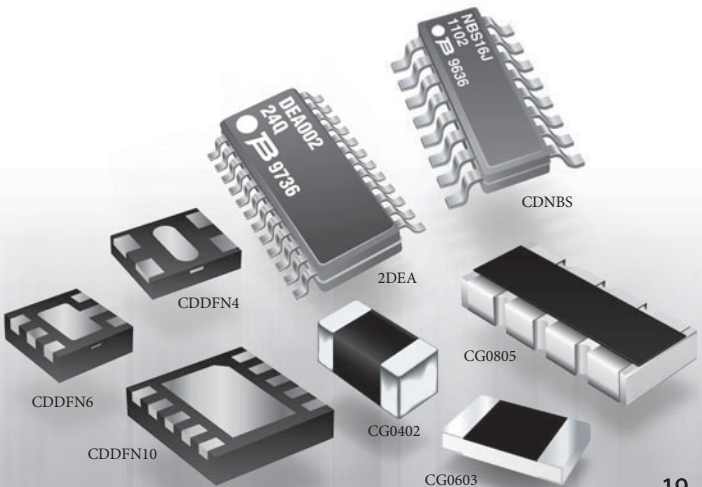
Ceramic PTC Products

Applications

Overcurrent protection for telecom applications:

Customer premise equipment (CPE)

Central office (CO)

Access equipment POTS

xDSL and integrated linecards

PABX protection

VOIP protection

Set top boxes

Types Available:

- Radial leaded through-hole
- Surface mount
- Dual packaged surface mount
- Dual packaged radial leaded through-hole
- Unencapsulated disk or chip

Features:

- Aids compliance with:
  - *ITU-T K.20/21/45*
    - *Telcordia GR-1089-CORE*
    - *UL 60950, 3rd Edition*
- UL recognized
- Matching available with narrow resistance tolerance
- Alternative tolerances and resistances on request
- RoHS compliant*

CMF-RLC

CMF-RL

CMF-RD

CMF-SD

*RoHS Directive 2002/95/EC Jan. 27, 2003 including Annex.
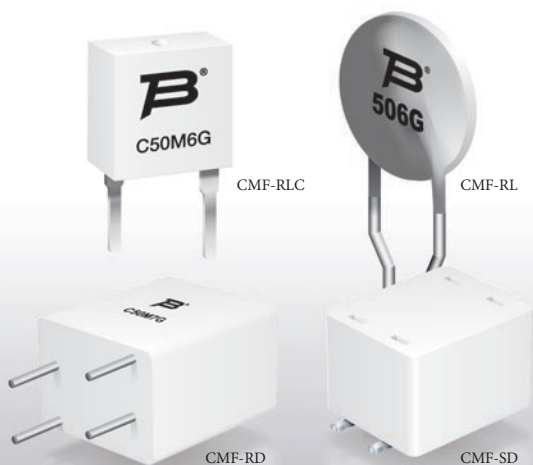
SinglFuse™
Thin Film Chip Fuses

Applications

Portable memory
LCD monitors
Disk drives
PDAs
Digital cameras
DVD players
Cell phones
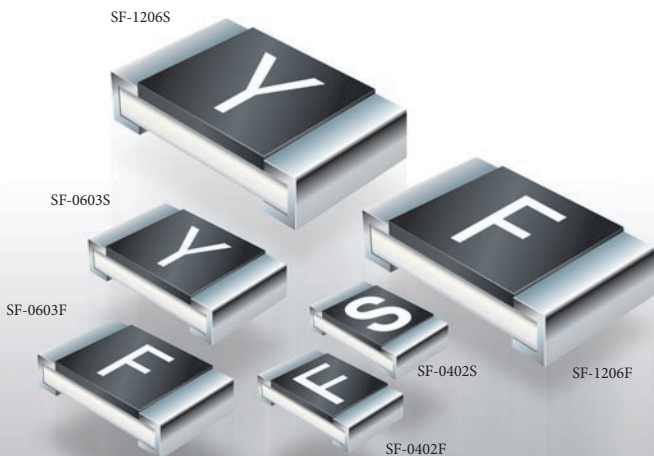Rechargeable
battery packs
Battery chargers
Set top boxes
Industrial controllers

Types Available:

- Fast acting fuse
- Slow blow fuse
- Surface mount
- 3 available footprints:
  - *0402 (1005 Metric)*
  - *0603 (1508 Metric)*
  - *1206 (3216 Metric)*

Features:

- Single blow fuse for overcurrent protection
- UL certified
- Surface mount packaging for automated assembly
- Thin film chip fuse
- RoHS compliant* and halogen free
- Wide range of both fast & slow blow fuses in 3 product sizes

SF-1206S

SF-0603S

SF-0603F

SF-0402S

SF-1206F

SF-0402F

*RoHS Directive 2002/95/EC
Jan. 27, 2003 including Annex.

Microelectronic Modules

Applications

Telecommunications

Fiber optic assemblies

Instrumentation

Industrial controls

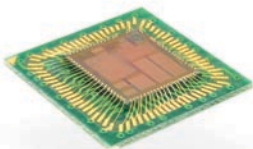Medical equipment
(excluding critical life support)

Automotive

Types Available:

- Single in line package
- Dual in line package
- SMT
- BGA
- System in package
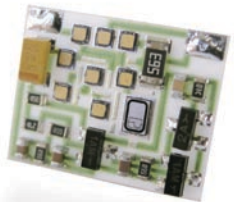- Custom packages

Features:

- High density thick film
- Fine pitch SMT
- Chip & wire
- Flip chip
- Stud bump bonding
- RF packaging

Chip Scale Packaging

Thick Film Modules

Fiber Optic

Medical Implant

GPS/Wi-Fi/Bluetooth

Commercial Panel Controls & Encoders

Applications

Types Available:

Panel Controls

- Rotary
- Motorized rotary
- Slide (open frame & metal housing)

Encoders

- Incremental contacting

Features:

Mounting Options

- Bushing
- Bushingless
- PC mount
- Solder lug

Sizes (vary by model)

- 9 to 24 mm (rotary panel controls)
- 10 to 100 mm (slide panel controls)
- 12 and 16 mm square (encoders)

Options

- Panel controls:
  - *Rotary switch option[†]*
  - *Multi-cup option[†]*
  - *Push/pull switch option[†]*
  - *T-bar lever option[†]*
- Encoders:
  - *Detents available on some resolutions*
  - *Momentary push switch*

PTS

PTL

PEC11

PEC12

PEC16

PDB18

PDB183

PRM16

PDB241-GTR

[†] available on some models

23

Industrial Encoders

Applications

Types Available:

- Incremental contacting
- Incremental magnetic
- Absolute contacting
- Absolute/PWM magnetic
- Incremental optical

Features:

Mounting options

- Bushing
- PC board
- Snap-in
- Servo

Resolution

- Contacting – 6 PPR to 36 PPR options
- Optical – 25 PPR to 256 PPR options
- Magnetic - 32 PPR to 512 PPR and 1024 PPR states options

Sizes (vary by model)

- 9, 16, 22 mm square & 16 mm x 22 mm

Options

- Detents available on some models
- Momentary push switch available on some models
- Shaftless versions
- IP 67

EM14

EMS22

EAW

EPS

Industrial Panel Controls

Applications

Types Available:

- Rotary

Features:

Mounting options

- Bushing
- PC mount
- Snap-in
- Reverse audio

Output

- Linear
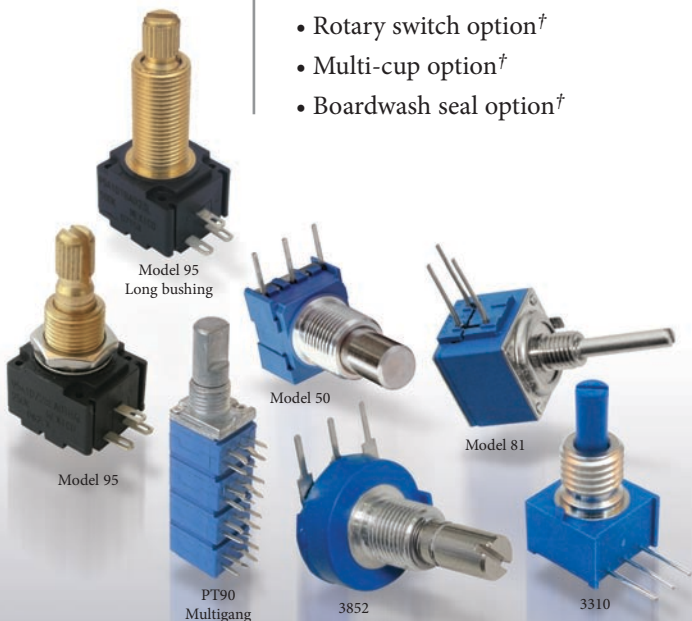- Audio taper
- Custom taper

Sizes (vary by model)

- 9 to 23 mm

Terminal Styles

- PC pins
- Solder lugs

Options

- Flexible lead-wires
- Rotary switch option[†]
- Multi-cup option[†]
- Boardwash seal option[†]

Model 95
Long bushing

Model 95

Model 50

Model 81

PT90
Multigang

3852

3310

† available on some models

Precision Controls

Applications

Communications
equipment

Test and measurement
instrumentation

Amplifiers

Medical instrumentation
and equipment
(excluding critical life support)

Industrial equipment
controls

Environmental test
equipment

Types Available:

- Rotary
- Digital push-button

Features:

Mounting options

- Bushing
- Snap-in
- PC mount
- Servo mount

Output

- Linear
- Custom taper
- Audio taper
- Reverse audio

Sizes (vary by model)

- 13 to 51 mm diameter

Terminal Styles

- PC pins
- Turret terminals
- Solder eyelets
- Insulated flexible wire leads

Options

- Rotary switch option*†*
- Single and multiturn models*†*
- Multi-cup option*†*
- Boardwash seal option*†*

3683

6639s

3540

3549

6539

3400

6639

† available on some models

Turns-Counting Dials

Applications

Power supplies

Test and measurement instrumentation

Medical instrumentation and equipment
(excluding critical life support)

Industrial equipment controls

Environmental test equipment

Automation control panels

Types Available:

- Digital
- Concentric dial

Features:

Materials

- Metal (industrial)
- Plastic (commercial)

Turns

- Up to 30 turns available

Sizes (vary by model)

- 22 to 46 mm

Options

- Black face and silver face dials available
- Locking brake

CT-23

H-22

H-23

H-506

H-490

Solutions in Sensor Technology

Applications

ABS wheel speed
Accelerator pedal
Active steering
Brake pedal module
Chassis level
Electric park brake
EPAS
Exhaust gas recirculation
Fuel tank level
Gear position
Steer -by-wire
Steering torque
Throttle position
Transmission speed

Types Available:

- Customer specific
- Position, speed and torque sensors

Features:

- Contacting and non-contacting solutions
- Engineering support capabilities
- All manufacturing sites are TS 16949 certified
- In-house design, tool making, screen printing, cermet firing & injection molding capabilities
- Development of proprietary resistive ink
- Innovative and cost-effective solutions

Pedal Angle Sensor

Chassis Level Sensor

Torque Sensor for EPS Steering Gear

Multiturn Steering Angle Sensor

Pedal Position Sensor

Automotive Circuit Protection

Applications

Window regulators

Seat adjustment motors

Sunroof activation motors

Powerbus (mode protection) applications

Other DC motor applications

Car alarm systems

Power steering motors

GPS shark fin antennae

Cooling & HVAC systems

Electronic control unit (ECU) input/output protection

Load dump and other transient voltage protection

Infotainment, telematics and navigation input/output protection

Types Available:

- TVS diodes
- Multifuse® PTC resettable fuses
- Metal alloy stunts
- ChipGuard® MLVs

Features:

- Overcurrent and overvoltage protection for automotive applications
- TS 16949 quality system
- Resettable PTCs suitable for application temperatures up to 125 °C
- Majority certified to AEC-Q200-Rev C
- Wide range of current ratings 0.05 - 20 A
- Dedicated automotive CP team
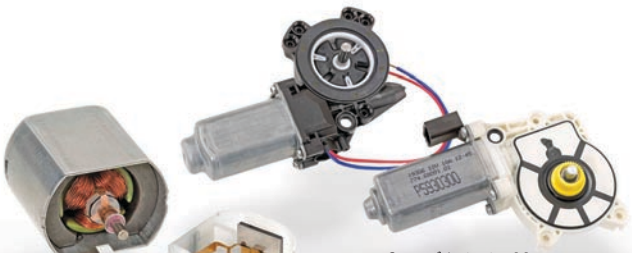
Seat Adjustment Motor

Sunroof Activation Motors

Multifuse® PTC Resettable Fuses

Multifuse® PTC Resettable Fuses

Fuel Cards

Applications

Types Available:

- Rectangular ceramic substrates
- Various ink systems:
  - *Resistor*
  - *Terminations/wiper tracks*
  - *Protective glazes/polymers*
- Wires attached
- Tinned solder pads
- Single or double side printing

Features:

- Customer specific patterns
- Up to 100 discrete resistance steps
- Typical resistance ranges from 95 ohms to 1.7k ohms
- Rated current 100 mA
- In line, 100 % dynamic electrical test
- Life cycles:
  - *Up to 1 million dry*
  - *Up to 3 million wet*

Fuel Cards

Bourns Web Site

Our interactive, user-friendly site contains the answers to your product and design questions with the most accurate and up-to-date Bourns information. Data sheets, application notes and other technical information are available in easy-to-download, PDF format.

Visit our web site:
www.bourns.com

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